N61165.AR.002886
CNC CHARLESTON
5090.3a

LETTER REQUESTING MONITORING WELL PERMITS ZONE A CNC CHARLESTON SC
7/3/1996
ENSAFE/ ALLEN AND HOSHALL

**EnSafe / Allen & Hoshall**
a joint venture for professional services

5720 Summer Trees Dr. Suite 8 Memphis, TN 38134
(901) 383-9115 Fax (901) 383-1743

2901-0842

July 3, 1996

Mr. Paul Bergstrand
Bureau of Solid and Hazardous Waste
South Carolina Department of Health and Environmental Control
8901 Farrow Road
Columbia, SC 29203

Re: Request for Monitoring Well Permits
Naval Base Charleston, Zone A RFI (CTO 2901)

Dear Mr. Bergstrand:

EnSafe/Allen & Hoshall (E/A&H) is proposing to install up to seven shallow, two intermediate, and two deep monitoring wells based upon the recent Geoprobe sampling event at Naval Base Charleston (NAVBASE). The locations of these wells are in the northwest portion of Zone A, specifically SWMU 39 (Former POL Drum Storage Area, Building 1604). Enclosed is a site map that illustrates the approximate locations and the well identification numbers.

The well location strategy for this event was outlined in a memorandum dated June 28, 1996 that detailed the results of the geoprobe investigation. Six of the seven shallow locations (NBCA-039-006 through NBCA-039-011) are sited to provide permanent sampling points at the boundary of the suspected chlorinated solvent plume. These locations will permit monitoring of any migration of contamination on or off NAVBASE. Two existing wells (CNSY-02-04 and CNSY-02-06) also bound the plume and will be sampled for VOCs in the future. The other shallow well location (NBCA-039-012) is between Buildings 1604 and 1605. This was the location of the greatest chlorinated solvent detections during the geoprobe investigation.

Shallow monitoring well NBCA-039-011 has been added since the June 28 memorandum. This well will not only contribute to the data set that bounds the suspected plume, but it will also permit more definitive potentiometric maps of the groundwater flow in the northwest corner of NAVBASE. This information is critical to monitoring potential migration of contamination off of NAVBASE.

The deep well (NBCA-039-08D) was proposed as a deep boring in the June 28, 1996 memorandum. It has been changed to a well installation to provide long-term monitoring of the deep aquifer in this "downgradient" direction. The other three wells (NBCA-039-08I, NBCA-039-12D, and NBCA-039-12I) are included in this permit application as "contingency" because they will depend on the conditions encountered during the installation of NBCA-039-08D.

**Contingency Wells**

NBCA-039-08D is proposed because it is necessary to determine the horizontal and vertical extent of chlorinated solvent contamination near SWMU 39. Unfortunately, there is limited information currently available regarding the potential vertical migration of contamination. This was considered during the geoprobe investigation, but no deep investigation was conducted in order to prevent opening a conduit for contaminant migration.

After careful consideration, E/A&H has determined that the best method for investigation of deeper groundwater onsite will depend upon the conditions encountered during the boring of NBCA-039-08D. Therefore, three wells are proposed for permitting based upon the following scenarios:

1. NBCA-039-12D

   The shallow and deep aquifers are separated by a layer of marsh clay in the northern portion of Zone A as evidenced by the boring logs from wells NBCA-039-04D and NBCA-038-01D. However, approximately 1,200 feet south/southeast of NBCA-039-04D, no marsh clay was encountered during the installation of NBCA-GDA-02D.

   It is unknown whether marsh clay will be encountered in the new well (NBCA-039-08D) since it will be located between NBCA-039-04D and NBCA-GDA-02D. If no marsh clay is encountered during the installation of NBCA-039-08D, then the location at NBCA-039-12D will be critical for determining the location of the marsh clay aquitard. If marsh clay is encountered in NBCA-039-08D, then NBCA-039-12D will further define the extent of the aquitard and provide monitoring of the deep aquifer beneath the plume since its location is near the greatest concentration of chlorinated solvent detections during the geoprobe investigation. If marsh clay is encountered at NBCA-039-12D, then a surface casing will be set approximately 2 feet into the marsh clay. Our best estimation is that the surface casing will extend to approximately 25 to 30 feet below ground surface (bgs).

2. NBCA-039-08I

   Further review of the boring log for NBCA-039-04D revealed three permeable zones. The shallow aquifer (screened interval for NBCA-039-004) was followed by a 3-foot thick layer of marsh clay. Next was a 16-foot thick layer of silty sand overlying 11 feet of "dewatered" marsh clay. This marsh clay was stiffer and impermeable, although some "sandy stringers" were noted in the unit. The lower sand followed and was selected for the location of the screened interval at NBCA-039-04D.

No monitoring of the intermediate zone (16 feet thick) has been conducted. If an intermediate zone is noted during the drilling of NBCA-039-08D, a well (NBCA-039-08I) will be installed to provide a monitoring point in this zone downgradient from the solvent plume.

3. NBCA-039-12I — If an intermediate zone is noted during the drilling of NBCA-039-12D, a well (NBCA-039-12I) will be installed (see above). This well will also have a surface casing in a similar manner as NBCA-039-12D.

This well permit request, including contingencies, has been prepared to permit the installation of these wells in a timely manner. E/A&H is cognizant of SCDHEC's concern regarding the potential migration of contamination toward the west (off NAVBASE). Tentatively, mobilization to the field for the well installations is set for no later than Monday, July 15, 1996.

If any field observations warrant the addition of any monitoring wells, another permit request will be generated from the field. If any of the "contingency" wells are not required based upon field observations, you will be notified in writing within one week of the end of field work.

All well installation, development, and sampling will be performed in accordance with Revision No. 01 of the *Final Comprehensive Sampling and Analysis Plan* (CSAP) dated December 1, 1995. Although this document has not received final regulatory approval, the applicable sections did not receive comments requiring modifications.

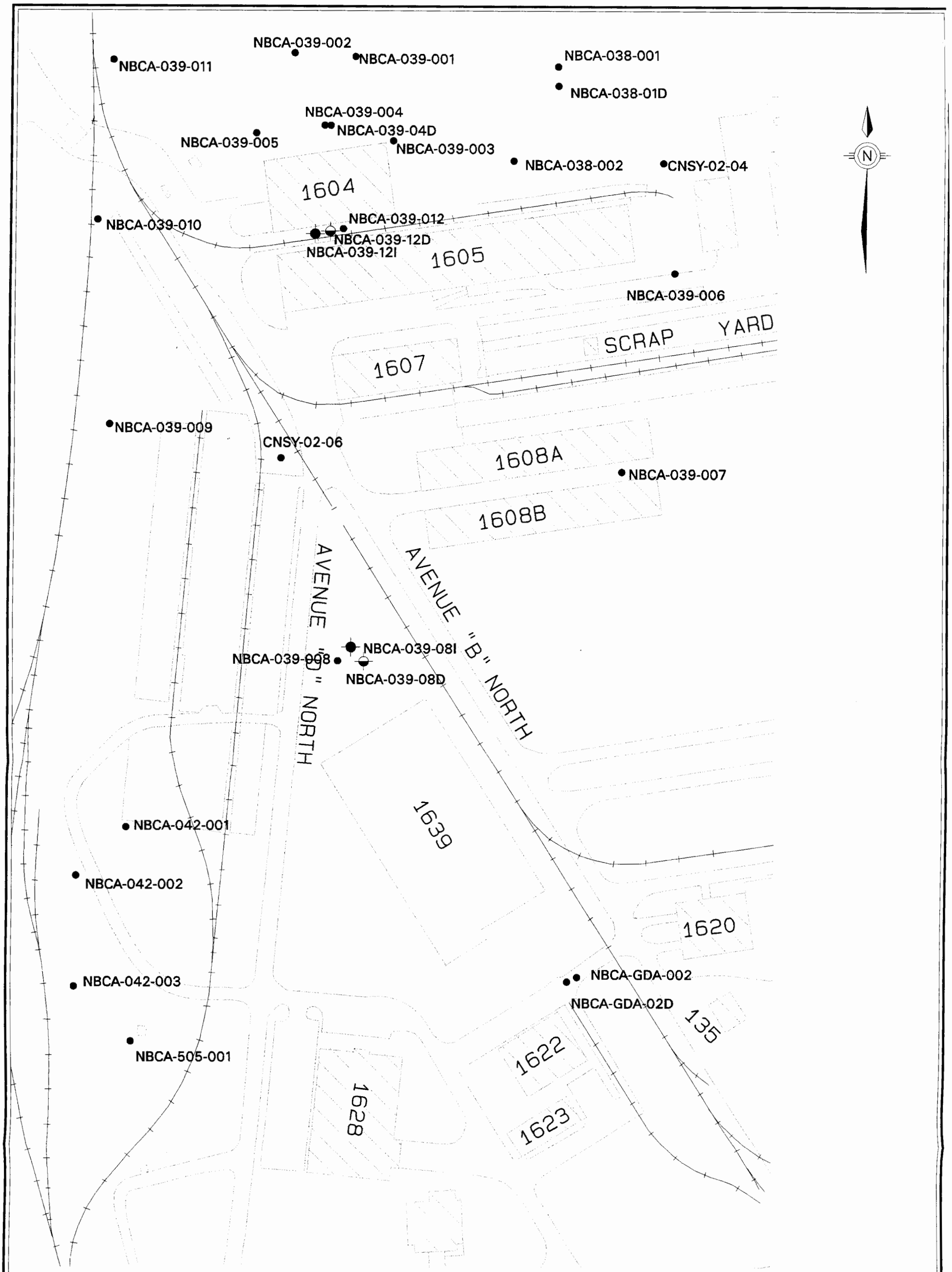
Groundwater samples for VOC analysis will be collected from each of these wells after installation, and subsequent sampling will be conducted on a quarterly basis. If there are any questions regarding this proposal, please call me at (901) 372-7962 or Todd Haverkost at (803) 884-0029 in the E/A&H Charleston office.

Sincerely,
EnSafe/Allen & Hoshall

By: Lawson M. Anderson, CHMM
Task Order Manager

Attachment

cc: M.A. Hunt, SOUTHDIV
Todd Haverkost, E/A&H
Project file (CTO 2901-08420)




Note: Red Indicates "Contingent" Well Locations

- Existing Wells
- Proposed Shallow Wells
- Proposed Intermediate Wells
- Proposed Deep Wells

**NAVBASE Charleston**
**Zone A**
**Geoprobe Investigation**

**FIGURE 1**
**Location of Zone A Proposed Wells**